
Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2025
Programme Name: B Sc (NS)
Semester: III
Subject Code: UG21T6301
Subject Name: Marine Meteorology

Date: 05.12.2025

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.
- (iii) Ships Weather Code to be used.

Section A

Answer all 10 questions, MCQ / Fill in the Blanks / True or False
(10x1mark= 10 marks) – Choose the correct answer as applicable.

1. Which instrument is used to measure atmospheric pressure?
 - (a) Hygrometer
 - (b) Anemometer
 - (c) Barometer
 - (d) Psychrometer
 2. An _____ (Ocean current/Tidal stream) is the general movement of a body of sea water on a permanent, semi-permanent or seasonal basis.
 3. Tropical Revolving Storms (TRS) originate in latitudes between.....(50° and 65°/ 5° and 20°)
 4. Icebergs of glacial origin have (regular/irregular) shapes and hence are not good radar targets.
 5. If the pressure indicated by the Aneroid Barometer on the bridge is 996.5 mb and the Bridge is 15 m above sea level, then what is the atmospheric pressure at that place :
 - (a) 999.5 mb
 - (b) 998 mb
 - (c) 1000.5 mb
 - (d) 995 mb
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6. What is the westernmost longitude reached by the TRS centre at the time of recurring called as :

- (a) Vortex
- (b) Vertex or Cod
- (c) Crest
- (d) Trough

7. How is the tidal range on the days of Spring tide

- (a) Tidal range is maximum
- (b) Tidal range is minimum
- (c) Tidal range is exactly at the mean average for the month
- (d) Neither Spring nor Neap tides influence the tidal range

8. Which among the following effect ocean tides:

- (a) Earth and Moon
- (b) Moon and Star
- (c) Sun and Moon
- (d) Earth and Sun

9. Hydrometer is used to measure Dew point (True/False)

10. A Tropical Revolving Storm may cause the water level in coastal areas to rise suddenly leading to a _____ (Storm Surge/Tsunami)

Section B

Five Questions of 02 Marks each

- 11. Explain Buys Ballots Law.
- 12. Define Isobar and Barometric Tendency.
- 13. Explain how Katabatic winds get formed.
- 14. With reference to a Tropical Revolving Storm, define the terms Vertex and Dangerous Quadrant
- 15. What factors affect the salinity of surface seawater and how?

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

- 16. Encode the following weather report using the Ships Weather Code.
(10 marks)

Ship: ATTA, Position: 00deg. 03S 045deg. 56W,

CMG in last 3 hrs. 315 deg. At 12 kts.

Visibility: 11 nautical miles

Wind: 140 degrees estimated at 3 kts.

Atmospheric Pressure: 1011.2 mb. Tendency: +2.2 mb Barograph trace: ———

GMT: 01d 18h 15m

Temperature: Dry 27.5 deg. C Wet 23.8deg. C Sea 22.8deg. C

Clouds: Total- 5 oktas, low clouds- 4 oktas of the sky, base 1500 m above sea level

Cumulus of moderate vertical extent, Altocumulus present with Nimbostratus. No high level clouds seen

Present Weather: Intermittent slight drizzle

Past Weather: Clouds covering more than half of the sky throughout, Rain

Sea: Period 2 sec, Height 0.5 m

Swell: From 050 deg. Period 4 sec, height 1 m.

17.

a) Explain weather routing as well as it's uses for safe and efficient vessel navigation. (5 marks)

b) Describe the Southwest monsoon regime occurring seasonally over the Indian subcontinent. (5 marks)

18.

a) With the help of sketches, explain sequentially the origin and formation of a Frontal Depression. (5 marks)

b) With the help of sketches, explain the formation of Land and Sea Breeze. (5 marks)

19.

a) Write a short note on the Voluntary Observing Fleet program under the Indian Meteorological Department. (5 marks)

b) Explain Synoptic and Prognostic categories of weather facsimile charts (5 marks)

20.

a) Explain in detail the risks associated with accumulation of ice on ships. (5 marks)

b) Explain the formation of Advection Fog and enumerate the reasons for it's dispersal, mentioning any one area in the world where mariners are likely to experience advection fog. (5 marks)

21. a) Explain in detail the 1-2-3 theory of Tropical Revolving Storm avoidance along with a sketch of the same. (6 marks)

b) Enumerate and explain in brief the ideal conditions for the formation of a Tropical Revolving Storm. (4 marks)

22.

a) Explain with the help of a sketch, the principal, construction and operation of an Aneroid Barometer. (5 marks)

b) What are the main causes for the formation of ocean currents? State any two examples each, of cold currents and warm currents. (5 marks)

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